

Name: ANSWER KEY Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Unit 5 Practice Test

### Proportions

$$\frac{3}{4} = \frac{c}{20}$$

$$\frac{60}{4} = \frac{4c}{4}$$

$$\boxed{15 = c}$$

$$\frac{8}{15} = \frac{4}{w}$$

$$\frac{8w}{8} = \frac{60}{8}$$

$$\boxed{w = 7.5}$$

$$\frac{x}{8} = \frac{x-5}{6}$$

$$6x = 8(x-5)$$

$$6x = 8x - 40$$

$$-8x - 8x$$

$$\frac{-12x}{-8} = \frac{-40}{-2}$$

$$\boxed{x = 20}$$

$$\frac{d-2}{d-9} = \frac{3}{14}$$

$$14(d-2) = 3(d-9)$$

$$14d - 28 = 3d - 27$$

$$+28$$

$$+27$$

$$14d = 3d + 1$$

$$-3d - 3d$$

$$11d = 1$$

$$\boxed{d = \frac{1}{11}}$$

### Percent Change

A person jumps from 20 ft to 15 ft.

$$\frac{20-15}{20} = \frac{5}{20} = .25 \times 100$$

$$\boxed{25\% \text{ decrease}}$$

The lions won 16 games last year and 20 games this year.

$$\frac{20-16}{16} = \frac{4}{16} = .25 \times 100$$

$$\boxed{25\% \text{ increase}}$$

### Ratio and Unit Rates

A 12-ounce can of green beans is sold for \$1.45. What is the price per pound?

$$\frac{1.45}{12} = \frac{\$1.2}{102}$$

so

$$\boxed{\frac{\$1.93}{16}}$$

A 40 : 1 scale model of an airplane is being used to conduct wind-tunnel tests. If the model is 4.5 ft long, how long is the actual airplane?

$$\frac{40}{1} = \frac{x}{4.5}$$

180 feet

$$x = 40 \cdot 4.5$$

$$x = 180$$

A scale on a map is 1 in : 25 mi. You measure 6.5 inches. How many miles is the actual distance?

$$\frac{1 \text{ in}}{25 \text{ mi}} = \frac{6.5 \text{ in}}{x}$$

162.5 miles

$$x = 25 \cdot 6.5$$

$$x = 162.5$$

The ratio of teachers to students for our Echo Hill field trip is 1:12. If there are 90 students in the 7<sup>th</sup> grade, how many teachers do we need to bring as chaperones?

$$\frac{1}{12} = \frac{x}{90}$$

8 chaperones

$$\frac{12x}{12} = \frac{90}{12} \quad x = 7.5$$

**Situation:** Suppose you walk 4 miles in 30 minutes.

Find the rate in miles per hour.

$$\frac{4 \text{ mi}}{30 \text{ min}} = \frac{8}{60 \text{ min}}$$

8 mph

Write a rule to describe the distance  $d$  you walk as a function of the time  $t$  you walk.

$$d = 8t$$

Use the function to find how far you would walk in 3 and half hours.

$$d = 8(3.5)$$

$$d = 28$$

28 miles

### Sales tax and discount

Mrs. CK spent \$205.60 at Target. If the sales tax is 6%, what was her final bill?

$$\begin{array}{r} 205.60 \\ \times .06 \\ \hline 12.34 \end{array}$$

$$\begin{array}{r} 205.60 \\ + 12.34 \\ \hline \$217.94 \end{array}$$

\$217.94

Joe transfers 15% of his monthly pay into a savings account. If Joe makes \$1850 per month, how much will he save in a year?

$$\begin{array}{r} 1850 \\ \times .15 \\ \hline 277.5 \end{array}$$

$$\begin{array}{r} 277.5 \\ \times 12 \\ \hline 3330 \end{array}$$

\$3,330

### Simple Interest

Doug invested \$140. He earned a simple interest of 3% per year on the initial investment. If no money was added or removed from the investment, what was the amount of interest Doug received at the end of two years?

$$I = \underline{7}$$

$$p = \underline{140}$$

$$r = \underline{.03}$$

$$t = \underline{2}$$

$$I = prt$$

$$I = (140)(.03)(2)$$

$$I = \$8.40$$

You will have a choice on the test. You will not have to complete ALL four problems. On this practice test, you do... it's great practice!!!

**Situation:** Justin takes the bus from his home to school, and the trip takes him a half-hour. On the return trip home, Justin rides his skateboard, traveling at an average rate that is fifteen miles per hour slower than the bus, and the trip takes one hour. **What is the average speed of the bus?**

a. What type of DRT Problem is this?

round trip

b. Write the GENERAL equation for this type of problem.

$d=d$  or  $rt=rt$

c. Define a variable.

Let  $r$  = rate of bus

d. Fill in the DRT Table below.

	rate	time	Distance
to school	$r$	$\frac{1}{2}$	$\frac{1}{2}r$
to home	$r-15$	1	$r-15$

e. Using the GENERAL equation from part b and your table, WRITE AND SOLVE an equation for the situation.

$$\frac{1}{2}r = r - 15$$

f. Solve the equation.

$$\begin{array}{r} \frac{1}{2}r = r - 15 \\ -r \quad -r \\ \hline \end{array}$$

$$(-2) \cdot \frac{1}{2}r = -15(-2)$$

$$r = 30$$

**ANSWER THE QUESTION:**

The average speed of the bus is 30 mph.

**Situation:** JaNei leaves the library at two pm at an average speed of 40 mph. Milan notices that JaNei left her wallet behind, and leaves the library at two-thirty pm at an average speed of 50 mph to catch up to JaNei. **At what time will Milan catch up to JaNei?**

a. What type of DRT Problem is this? *Catch up*

b. Write the GENERAL equation for this type of problem.  *$d = d$  or  $rt = rt$*

c. Define a variable.

*Let  $t$  = JaNei's travel time*

d. Fill in the DRT Table below.

	rate	time	Distance
<i>JaNei</i>	<i>40</i>	<i><math>t</math></i>	<i><math>40t</math></i>
<i>Milan</i>	<i>50</i>	<i><math>t - \frac{1}{2}</math></i>	<i><math>50t - 25</math></i>

e. Using the GENERAL equation from part b and your table, WRITE AND SOLVE an equation for the situation.

$$40t = 50t - 25$$

f. Solve the equation.

$$\begin{array}{r} 40t = 50t - 25 \\ -50t \quad -50t \\ \hline \end{array}$$

$$\begin{array}{r} -10t = -25 \\ -10 \quad -10 \\ \hline \end{array}$$

$$t = 2.5$$

**ANSWER THE QUESTION:**

*Milan will catch up with JaNei  
at 4:30 pm*

**Situation:** Dylan and Helena are four hundred miles apart. Helena leaves at 3 pm, and Dylan leaves at 3:30 pm, traveling at an average rate that is ten miles per hour slower than Helena. If they meet up at 7 pm, **at what speed is Helena traveling?**

a. What type of DRT Problem is this? *meet up*

b. Write the GENERAL equation for this type of problem.  $d_1 + d_2 = TD$

c. Define a variable.

*Let  $r$  = Helena's speed*

d. Fill in the DRT Table below.

	rate	time	Distance
Dylan	$r - 10$	3.5	$3.5r - 35$
Helena	$r$	4	$4r$

e. Using the GENERAL equation from part b and your table, WRITE AND SOLVE an equation for the situation.

$$400 = 4r + 3.5r - 35$$

f. Solve the equation.

$$400 = 4r + 3.5r - 35$$

$$400 = 7.5r - 35$$

$$+ 35 \quad + 35$$

$$\frac{435}{7.5} = \frac{7.5r}{7.5}$$

$$58 = r$$

**ANSWER THE QUESTION:**

*Helena was travelling 58 mph.*

**Situation:** Luke and Simon are both at the same spot at Rock Creek Park. Luke heads north on his bike at 13 miles per hour at 1 pm. A half hour later, Simon heads south on his skateboard at 6 mph. **At what time will Luke and Simon be 35 miles apart?**

a. What type of DRT Problem is this? *opposite direction*

b. Write the GENERAL equation for this type of problem.  $d_1 + d_2 = TD$

c. Define a variable.

*Let  $t$  = Luke's total time*

d. Fill in the DRT Table below.

	rate	time	Distance
Luke	13	$t$	$13t$
Simon	6	$t - \frac{1}{2}$	$6t - 3$

e. Using the GENERAL equation from part b and your table, WRITE AND SOLVE an equation for the situation.

$$35 = 13t + 6t - 3$$

f. Solve the equation.

$$35 = 13t + 6t - 3$$

$$35 = 19t - 3$$

$$\frac{38}{19} = \frac{19t}{19}$$

$$2 = t$$

**ANSWER THE QUESTION:**

*Luke and Simon will be 35 miles apart at 3pm.*